

ON THE EXPLORATION OF THE CAVES OF ENNISKILLEN AND MITCHELSTOWN FOR THE  
R.I.A. FLORA AND FAUNA COMMITTEE.

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Early in 1895 Dr. Scharff informed me that Mr. E. A. Martel, the celebrated French explorer of caves, had determined to visit Ireland in July, with a view to investigating some of the numerous caverns with which our Carboniferous limestone is in places riddled.

I at once expressed myself anxious to join him in his explorations, and in due time was informed that the Fauna and Flora Committee of the Royal Irish Academy had done me the honour of making a grant to me for the purpose of further investigating the cave-fauna, already discovered at Mitchelstown by Dr. Wright and Mr. Haliday, and so ably described by Mr. Carpenter in his most interesting paper on the "Animals found in the Mitchelstown Cave" (*Irish Naturalist*, February, 1895).

On July 10th I left Dundalk for Enniskillen, where I hoped to meet Mr. Martel, whose investigations were to commence in that district. At Enniskillen I was met by Mr. Thomas Plunkett, M.R.I.A., who kindly made me his guest while I was there, and whose intimate knowledge of the geology and physical features of the district was of very great assistance to me in my work.

On July 11th I set off for Bohoe, where I was met by the Rev. A. Knight, who acted as my guide.

We first proceeded to investigate the underground river-bed at Bohoe, a winding subterranean watercourse. Beside the outlet was a dry cavern which presumably was once connected with the present river-bed, and has for some reason become cut off. It was only accessible for a short distance, large angular blocks, falling from the roof and walls, having formed an impassable barrier. This grotto must have been inhabited by numerous bats, as the floor was strewn with their

fæces, and also with the rejected wings of insects. The river-course itself, though at the time of my visit dry, is after heavy rains traversed by a mountain torrent, which evidently floods right up to the roof, as debris of all kinds, branches of trees, sods of turf, &c., were jammed into all crevices, even in the roof. Consequently no animals of the typical cave-fauna were to be found.

We entered at the end of the cave where the stream discharges itself, and noticed that just inside the exit, where exposure to weather had enlarged the calibre of the cave, there were two colonies of Daubenton's Bat (*Vespertilio Daubentonii*), clustered together in crevices in the roof like swarms of bees. I captured five specimens with some difficulty; they were all males, and two of them can now be seen in the Science and Art Museum, Dublin.

The invertebrates found in this cave had evidently been accidentally brought in by floods, with the exception of two large spiders, *Meta Menardii* and *Meta Merianæ*, which Mr. Carpenter, who has kindly identified the invertebrates collected, tells me often inhabit the entrances to caves. The other invertebrates were a water-bug, *Velia currens*, and two flies belonging to the genera *Erioptera* and *Molophilus*.

On leaving this cave Mr. Knight invited me to lunch at the Rectory, and, when there, showed me a Bat that he had killed in his room on the previous night. This proved to be the Whiskered Bat (*Vespertilio mystacinus*), another of our rarer Irish species. This specimen, a male, is now in the Science and Art Museum, Dublin. Some time after I left Enniskillen Mr. Knight sent me a specimen of the Hairy-armed Bat (*Vesperugo Leisleri*) taken in his house, a female Daubenton's Bat, and a Long-Eared Bat (*Plecotus auritus*) captured in the dry cavern to which I have already referred.

After lunch we explored Coolarkin, a cave of considerable dimensions, and one which must once have been traversed by a river of large size. All that now remains of the river is a small stream that sinks into the floor of the cave close to the entrance, meeting no doubt some watercourse at a greater depth. But, from the presence of flood-rubbish further in, I infer that in floods a stream of some kind traverses it, though the greater part is always dry. Any stream rising in the neigh-

bourhood could occupy but a small part of the vast capacity of this cave, which is in places fully forty feet high, and fifteen or twenty feet wide. Unfortunately a couple of hundred yards from the entrance further progress was prevented by a heap of fallen debris which completely blocked the way. At the inner end of the passage, where the heap of boulders stopped us, was a burrow, possibly belonging to a Badger, and Mr. Knight's dogs which had accompanied us showed by their excitement that the animal was within. This further supports my belief that this cave is in great part dry at all seasons.

The Invertebrates I found here are all species which occur above ground; they are—a spider, *Porrhoma microphthalma*, which Mr. Carpenter tells me has been found in a coal-pit, occurring also above ground; *Brachydesmus superus*, a blind millipede, which also occurs above ground; *Iulus pilosus*, a typical millipede; *Tomocerus tridentiferus*, a collembolan, found at Mitchelstown by Wright and Haliday; recorded by Packard from North American caves, occurs under stones above ground;<sup>1</sup> *Velia currens*, the water-bug found at Bohoe; a fungus-midge, *Sciara Thomæ*; and four beetles, *Bembidium rufescens*, *Ancyrophorus omalinus*, *Helodes marginata*, and *Coprophilus striatulus*; the last, Mr. Halbert tells me, has not hitherto been recorded as Irish. All these beetles inhabit moist, marshy places, and were probably washed into the cave.

After leaving Coolarkin cave we visited Bohoe church, where Mr. Knight informed me there was an immense colony of bats. We found a number of young Pipistrelles (*Vesperugo pipistrellus*) from a few days old to half-grown individuals, crawling about the floor of the church, having fallen through a hole in the ceiling. There must have been an immense colony in the roof, but unfortunately there was not a ladder at hand to enable me to inspect it. Having collected a number of these young bats I returned to Enniskillen, as darkness was already coming on.

On July 12th, next day, I drove to the Marble Arch, at Florence-Court, and, after collecting a few invertebrates about the grounds, I was met by Mr. Bowles, the keeper, who accom-

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<sup>1</sup> For this and other information respecting the invertebrates found I am indebted to Mr. Carpenter.

panied me to the caves. In the Marble Arch cave, which is a favourite resort for tourists, I collected a few invertebrates which, like those collected on the previous day, were species which occur above ground.

This cave is, I may here remark, in its upper part dry, the river that has carved it out having found a passage on a lower level, and appearing as a spring some distance in. Here I took *Porrhoma microphthalma*, *Brachydesmus superus*, *Tomoceerus tridentiferus*, and *Clivina fossor*, a carabidous beetle.

None of the other Florence Court caves were accessible without Mr. Martel's exploring apparatus, so I had to defer my visits to them till his arrival.

On the 15th Mr. and Mrs. Martel and I drove to the Arch Spring, and Noon's Hole, bringing with us in a cart Mr. Martel's copious equipment of cave-exploring apparatus. This consisted of a canvas boat, some hundreds of feet of rope-ladders, a light portable folding wooden ladder, ropes, axes, compass, barometer, telephone, maps, &c.

We first proceeded to Noon's Hole, which is a vertical shaft or swallow-hole down which a stream precipitates itself. Mr. Martel sounded the shaft with a lead-line and found the depth to be 150 feet. The rope ladders were then got ready and Mr. Martel began his descent; he could not, however, descend more than about 60 feet, as the falling water, which at the time was unusually high, broke over the ladder and rendered further progress impossible. The descent of this chasm would be made possible if the stream could be for a time deflected.

We also explored Poolaneffaran, a pit formed partly by the falling in of the roof of an underground river-bed.

The streams traversing Noon's Hole and Poolaneffaran converge to form the Arch spring, where they discharge themselves through a beautiful grotto, and form a waterfall. In the Arch spring I found *Meta Merianæ*.

On the 16th we visited the Marble Arch, bringing the same equipment. Here we were met by Mr. Bowles and his son, who accompanied us to the caves. Several streams, meeting underground, flow out at the source, under the "Marble Arch," a beautiful natural archway, cut off from the cave.

The first cavern we explored we gained access to by means of an entrance at the bottom of a pit, formed evidently by the falling in of a part of the roof. After exploring several dry galleries and a vertical swallow-hole opening on the hill above us, we found on a lower level the river itself. Further progress was impossible without the boat, as a large and deep pool, an expansion of the underground stream, barred our way. The boat was brought into the cave, its constituent parts filling two large canvas bags, and was put together; by this means we were able to investigate this hitherto unexplored river. A detailed account of this "voyage" would occupy too much space, and no doubt it will in due time be fully described by Mr. Martel. The stream was "navigable" for about 300 yards.

We afterwards investigated some small swallow-holes which mark above ground the course of these streams. The chief stream, the Monaster, as it is called, enters upon its subterranean course at Poolawaddy.

Above this its course is through a deep narrow gorge, which ends in a cliff, into a cavern in which the stream falls. I was informed that in heavy floods the volume of water in this gorge is so much greater than the cave can quickly drain off that the valley becomes a deep lake.

This day's work completed our Enniskillen explorations.

From the 22nd to the 25th of July I was engaged exploring Mitchelstown Cave. I will not attempt any description of this underground labyrinth, as it has now been completely mapped by Mr. Martel, who is publishing in this number of the *Irish Naturalist* a description and plan of it. It was discovered some sixty years ago by the grandfather of the present tenant of the land on which is the entrance; he broke into one of the obstructed swallow-holes when quarrying. This is the only known opening. The so-called "river" is only a little pool of water in a basin of rock. I fully explored it, crossing over to the opposite side of it. I found that its high-water line is marked all round by a calcareous deposit, and, when it is flooded up to this, it empties itself by a small opening, about a foot in diameter, into some deeper and unexplored chamber.

Although no opening is known except the artificial one by which we entered, the presence of a number of specimens of an above-ground staphylinid beetle, *Ancyrophorus omalinus*, all dead, and floating on the surface of another small pool of water (about eight or ten feet in diameter and a foot deep) points to the fact that water has access from the outer world otherwise than by infiltration.

In the passage called the "Mud Cave," which is the deepest part, is a vertical shaft, the walls of which are thickly coated with fine red extremely sticky mud, so that descent without ropes would be impossible; I tried to get down, but the mud, sticking to my boots in large masses, threatened to pull me down more rapidly than would have been pleasant, so I had to leave it. This shaft has never been explored, but as it is in the deepest known part of the cave I feel pretty certain that if it could be followed it would be found to lead into some deeper passages, and perhaps to the bed of the river that must in former times have drained the cave. Mr. Martel, however, does not attach much importance to this pit, but he has very generously made me an offer that, if I wish to carry out further explorations, he will lend me some of his ladders. About four or five hundred yards west of the entrance is a swallow-hole, which opens on the side of a hill overlooking the valley north of the caves. This the guide informed me has once or twice been partly explored, but he could tell me nothing about it, except that he believed there was a river in some of the passages. It is not known to communicate with the other cave. The man who drove me from Mitchelstown to the caves informed me that there was a large spring a couple of miles south of the cave, but I could get no further information about it. The dip of the strata is towards the south.

The invertebrates I collected at Mitchelstown have all been identified by Mr. Carpenter; they are—

#### MITES.

*Gamasus attenuatus*; found in several parts of the cave, chiefly under paper and other refuse left by tourists.

#### SPIDERS.

*Porrhoma myops*; discovered by Mr. Carpenter in 1894 and recorded in his paper.

*Leptyphantes pallidus*; new to the Irish fauna; Mr. Carpenter tells me it is a rare species which has been found by Pickard-Cambridge in Dorsetshire, at roots of heather; also in caves in France and Bavaria; unlike the former species it has large eyes. Both these species occurred in the driest parts of the cave, under stones, and one or two specimens (? species) in webs among the boulders.

## MYRIAPODA.

*Brachydesmus superus*; found also in some of the Enniskillen caves.

## COLLEMBOLA.

*Tomocerus tridentiferus*; see remarks on this species under Coolarkin Cave.

*Sinella cavernicola*; occurred everywhere; on the whole I found this species frequenting drier spots than the *Lipura*. Mr. Carpenter tells me that my series of *Sinella* shows the species to be very variable in its antennal joints.

*Lipura Wrightii*; in almost every nook and corner of the cave, dry or damp, outnumbering all the other species.

## BEETLES.

*Ancyrophorus omalinus*; mentioned before, probably washed in.

*Trechus micros*; taken alive under stones.

Besides these "natives" of the cave, as with the exception of *Ancyrophorus* they may all more or less be called, I found a frog, a specimen of *Pterostichus vulgaris* (beetle), and a fungus midge belonging to the genus *Sciara*; these had evidently wandered in, and got lost in the darkness.

A small mollusc, taken in some numbers, has been identified by Dr. Scharff as *Hyalina contracta*, this is the second British record; first found at Killarney by Dr. Scharff; occurs in Sweden, Germany, France, and Switzerland; all the members of this genus live in concealed localities.

When an attempt is made to group together the various animals collected at Enniskillen and Mitchelstown, in relation to the physical conditions of the caves they were found in, it appears that they fall into several divisions.

(i.) Species inhabiting the entrances to caves, near the light, using the cave as a convenient hiding-place ; such are the two species of *Meta*, perhaps *Leptyphantès pallidus*, and the bats.

(ii.) Species which have wandered into the caves, accidentally, perhaps, or have been washed in by floods, and are so to speak " fish out of water ;" examples of such are the water-bugs and crane-flies from Bohoe ; *Iulus*, *Velia*, *Sciara* and the beetles from Coolarkin ; *Clivina fossor* from the Marble Arch ; and the frog, *Pterostichus*, *Sciara*, and *Ancyrophorus* from Mitchelstown.

(iii.) The *Troglodytes* ; only found in Mitchelstown, e.g. *Lipura*, *Sinella* and *Porrhoma myops*.

(iv.) Those species which do not fall under any of these three groups seem to me to form a division intermediate in position between the last two, and in most cases inhabiting caves which present conditions intermediate between Bohoe and Mitchelstown caves, which I may safely take as the extremes of my series. Such are *Tomocerus tridentiferus*, *Brachydesmus superus*, and *Porrhoma microphthalmus*, which seem to be equally at home above ground and underground. These creatures seemed quite at home in Coolarkin, and the dry part of the Marble Arch cave, and I see no reason to doubt that *Brachydesmus* and his companions in darkness may have lived and multiplied there for many generations, undisturbed by any such catastrophes as the floods that characterize Bohoe cave.

While fully aware of the great gap that exists between a cave-fauna of this type and that of Mitchelstown, I see no reason to doubt that at one time the Mitchelstown fauna was one somewhat of this type, consisting of a few unwary animals which got into the cave and had to make the best of it ; the isolation and probably much greater age of the Mitchelstown fauna may account for their specialization ; and if so, provided that among the many unexplored caves of Ireland we can find some presenting conditions intermediate between those we find in Coolarkin and in Mitchelstown, we may almost hope to fill up some of the gaps in the history of the evolution of cave-faunas.

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